

L-3527-66

AM5013202

- 65. Matrix elements of a crystalline field -- 553
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SUB CODE: EC

SUBMITTED: 26 Dec64

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Card

ACC NR: AP5026604 EWT(1)/EWP(e)/EWT(m) AT/WH

AUTHORS: Genkin, G. M.; Fayn, V. M.

SOURCE CODE: UR/0056/65/049/004/1118/1125

ORG: Radiophysics Institute of the Gor'kiy State University
(Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta)

TITLE: Contribution of the anharmonic character of crystal lattice
oscillations to the nonlinear properties of a crystal

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49,
no. 4, 1965, 1118-1125

TOPIC TAGS: crystal lattice structure, nonlinear effect, crystal
lattice vibration, Green function, dielectric susceptibility

ABSTRACT: The authors analyze the nonlinear properties of a crystal,
brought about by oscillation of the ion lattice, and evaluate the con-
tribution made to the third-rank cross susceptibility tensor by these
lattice oscillations. The expression for the cross susceptibility
tensor is derived by means of the technique of three-time temperature
Green's functions. The effect of ion motion on the symmetry of the
tensor with respect to its first two indices is considered and it is
shown that such symmetry is obtained in a certain approximation. The

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IJP(c)

JD/GG

ACC NR:

AP6016665

SOURCE CODE: UR/0056/65/049/004/1118/1125

AUTHOR: Genkin, G. M.; Fayn, V. M.

ORG: Radiophysics Institute, Gor'kiy State University (Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta)

TITLE: Contribution of anharmonicity of crystal lattice oscillations to the nonlinear properties of a crystal

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1118-1125

TOPIC TAGS: crystal lattice vibration, crystal property, second order phase transition, approximation, electromagnetic field

ABSTRACT: In conjunction with the appearance of highly monochromatic, high intensity, laser-produced electromagnetic fields, numerous researchers have begun investigating the nonlinear properties of crystals (see, e.g., V.M. FAYN, E.G. YASHCHIN, ZhETF /Journal of Experimental and Theoretical Physics/, 46, 695, 1964; J.F. WARD, P.A. FRANKEN, Phys. Rev., 133, A183, 1964; R.C. MILLER, D.A. KLEINMAN, A. SAVAGE, Phys. Rev. Lett., 11, 146, 1963). The present article investigates the nonlinear properties of a crystal caused by the oscillations of the ionic lattice. An expression for a third-order cross-susceptibility tensor is obtained using Green's triple-time temperature function. The cross-susceptibi-

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lity tensor $\chi_{abo}(\omega, \omega)$ in the approximation used turns out to be symmetric in a and b. The future continuation of this investigation will study the behavior of the nonlinear characteristics of a crystal near second-order phase transition points. Since the expressions for the cross-susceptibility obtained do not seem to have singularities during the approach toward zero of any of the crystal's eigenfrequencies, it is difficult to predict what will happen near such phase transition points. The authors thank Professor V. L. Ginzburg for the discussions of the questions pertaining to this work and E. G. Yashchin for his helpful criticism. Orig. art. has: 32 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: 20Feb65 / ORIG REF: 007 / OTH REF: 008

Card 2/2 FW

L 44701-66 EWT(1)T LJP(c) G3
ACC NR: AP6031337

SOURCE CODE: UR/0386/66/004/003/0100/0103

578
578

AUTHOR: Fayn, V. M.

ORG: Scientific Research Radiophysics Institute, Gor'kiy (Nauchno-issledovatel'skiy radiofizicheskiy institut)

TITLE: Infrared and microwave absorption in ionic crystals at high power levels.

SOURCE: Zh. eksper. i teoret. fiz. Pis'ma v redaktsiyu. Prilozheniye v. 4, no. 3, 1966, 100-103

TOPIC TAGS: ionic crystal, ir absorption, radio wave absorption, resonance absorption, microwave

ABSTRACT: The author demonstrates that anomalously large absorption (in the nonresonant case) and saturation of infrared resonance take place when an external electric field of sufficiently large amplitude is applied to a dielectric. These phenomena are connected with the occurrence of parametric instability of acoustic waves and are analogous to the corresponding phenomena in ferromagnetic resonance at high power levels. Solution of the equations for the stationary values of the amplitudes of the acoustic waves and of the optical oscillations shows that these phenomena can occur at critical fields on the order of 300 v/cm, which are perfectly feasible in the microwave band. The dielectric susceptibility above the threshold of the critical field is determined and is found to be independent of the applied field. Although the approximation used, which does not take fluctuations into account, is quite satisfactory at

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high power levels, it is pointed out that near the instability threshold allowance for the fluctuations is essential. However, theoretical calculations with allowance for fluctuations result in an equation which, while much more complicated than the approximate solution, is at the same time very little different from it. The author is grateful to G. M. Genkin for useful discussions. Orig. art. has: 9 formulas.

SUB CODE: 20/ SUBM DATE: 27May66/ ORIG REF: 001/ OTH REF: 002

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Cord 2/2

L 11610-66 EWT(1)/T IJP(c) AT

ACC NR: AP6018812

SOURCE CODE: UR/0056/66/050/005/1327/1331

AUTHOR: Fayn, V. M.

ORG: Radiophysics Institute of the Gor'kiy State University (Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta)

TITLE: Quantum generalization of the expression for energy dissipation

SOURCE: Zh eksper i teor fiz, v. 50, no.5, 1966, 1327-1331

TOPIC TAGS: quantum theory, energy theory, energy scattering, Hamiltonian, ground state

ABSTRACT: In order to obtain the correct value for the energy losses in a system in a form that is applicable to quantum-mechanical calculations, the standard classical formula for the dissipation of energy per unit time is generalized for the case when the system is acted upon by external forces whose energy of interaction is a quadratic function of these forces. It is shown that the standard expression is meaningful only in the classical region, when quantum correlations can be neglected. If these correlations cannot be neglected, the formula for the energy dissipation must be modified in such a way that the dissipation of the energy per unit time is defined as the average value of the time derivative of one of the components of the Hamiltonian operator, subject to certain commutation rules. As a result, the classical formula

$$Q = \frac{i\omega}{4} \sum_{ab} (\chi_{ab}^*(\omega) - \chi_{ba}(\omega)) f_{0a} f_{0b}^*.$$

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is replaced by a formula

$$Q_X = \frac{i\omega}{2} \sum_{ab} (\chi_{ab}^*(\omega) - \chi_{ba}(\omega)) \langle \{A_b^+ A_a\} - [A_a, A_b^+] \rangle$$

$$= i\omega \sum_{ab} (\chi_{ab}^*(\omega) - \chi_{ba}(\omega)) \langle A_b^+ A_a \rangle,$$

which is valid for both the classical and the quantum case, and which vanishes at $T = 0$ for the ground state of the system. The various approximations which affect the validity of the new formula as a generalization of the old ones are discussed. The author thanks Professor I. L. Bershteyn for discussions which have stimulated the publication of this paper. Orig. art. has: 17 formulas.

SUB CODE: 20/ SUBM DATE: 23Nov65/ ORIG REF: 003

Card 2/2

ACC NR: AP6036977

SOURCE CODE: UR/0181/66/008/011/3310/3319

AUTHOR: Genkin, G. M.; Fayn, V. M.; Yashchin, E. G.

ORG: Gor'kiy State University imeni N. I. Lobachevskiy (Gor'kovskiy gosudarstvennyy universitet)

TITLE: Nonlinear properties of a crystal lattice

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3310-3319

TOPIC TAGS: ^{ion}crystal, crystal lattice, ~~anharmonic~~ crystal ~~lattice~~ lattice vibration, Green function, cross susceptibility tensor, laser, ~~anharmonic lattice~~ vibration, Raman effect _{nonlinear}

ABSTRACT: An analysis is made of the nonlinear properties of an ion crystal induced by vibrations in the lattice. Using Green's multi-temporal temperature functions, an expression is obtained for the fourth-rank cross-susceptibility tensor as a function of third and fourth-order anharmonicity in lattice vibrations. Two-quantum, and particularly Raman processes, and the parametric interaction of four waves, are investigated. The contribution of the effects of spatial dispersion

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in a harmonic medium to the third-rank cross-susceptibility tensor is examined.
Evaluations are made of tensor magnitudes. [Based on authors' abstract]

[SP]

SUB CODE: 20/SUBM DATE: 16Oct65/ORIG REF: 007/OTH REF: 002/

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ACC NR: AP7005871

SOURCE CODE: UR/0181/66/COS/012/3662/3663

AUTHOR: Genkin, V. M.; Genkin, G. M.; Fayn, V. M.

ORG: Gor'kiy State University im. N. I. Lobachevskiy (Gor'kovskiy gosudarstvennyy universitet)

TITLE: Contribution to the theory of nonlinear properties of ferromagnets

SOURCE: Fizika tverdogo tela, v. 8, no. 12, 1966, 3662-3663

TOPIC TAGS: ferromagnetic material, nonlinear effect, adiabatic approximation, ferromagnetic resonance, magnetic susceptibility, spin orbit coupling

ABSTRACT: The authors consider a different type of nonlinear effects of ferromagnets, which can be described by expanding the polarization and the magnetization in powers of the products of the electric and magnetic fields. This is called nonlinearity of the mixed type, to distinguish it from the nonlinearities of the electric and magnetic type which have been discussed in the literature before. The analysis is carried out in the adiabatic approximation under the assumption that the frequency of the ferromagnetic resonance and the frequencies of the external fields are much lower than the characteristic frequency of the electron motion. This makes it possible to determine the Hamiltonian of the crystal as a function of the external electric and magnetic fields, and to use the coefficients of this Hamiltonian to determine the spin orbit interaction. This in turn makes it possible to determine the coefficients in the expansions for the polarization and for the magnetization. The elements of the sus-

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ceptibility tensor, which enters in these expressions, are estimated. Orig. art. has:
3 formulas.

SUB CODE: 20/ SUBM DATE: 21Jun66/ ORIG REF: 003/ OTH REF: 002

Card 2/2

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S/024/60/000/02/020/031

E140/E135

281000

AUTHOR: Fayn, V.S. (Moscow)

TITLE: On the Number of Coordinate Descriptions of an Image in a Pattern Recognition System

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 2, pp 164-172 (USSR)

ABSTRACT: An important part of pattern recognition machines is the device for converting the light signals to electrical or other perturbations. When this converter consists of a network of discrete elements the logical part of the machine receives information of the illumination of discrete elements and their coordinates. Recognition of a given pattern should be independent of its coordinate description. It is therefore of interest to determine the number of coordinate descriptions possible for a given pattern and network dimensions. The author introduces the following definitions. 1) The maximum dimension or scale of the pattern D is the distance between the two most remote points of its contour (Fig 1). 2) The smallest dimension d of the pattern which is the smallest of the following three quantities: the smallest

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On the Number of Coordinate Descriptions of an Image in a Pattern Recognition System

radius of curvature, the smallest distance between vertices of angles, or the smallest distance between two separate parts of the figuration for the case of concave-convex figures, projections, etc. 3) The ratio D/d is the coefficient of detail of the pattern. The number of possible coordinate descriptions of a single pattern is found from denumeration of the members of the following groups: the group of all transpositions; the group of rotations about a single arbitrary point; the group of scale changes. It is found that a general expression for the number of coordinate descriptions independent of the shape of the pattern does not exist. From this there follows theorem (1): Among all possible configurations having the same coefficient of detail there are at least two, termed limiting, of which one has the greatest and the second the smallest number of coordinate descriptions. It is then shown that the limiting patterns are a circle and a straight line segment. An appendix gives certain proofs of these results. ✓

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On the Number of Coordinate Descriptions of an Image in a Pattern
Recognition System

There are 2 figures and 2 English references.

SUBMITTED: December 4, 1959

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78140

SOV/108-15-3-3/17

AUTHOR: Fayn, V. S.

TITLE: On the Principles of Designing a Machine for Pattern Recognition

PERIODICAL: Radiotekhnika, 1960, Vol 15, Nr 3, pp 13-17 (USSR)

ABSTRACT: The paper is a brief review of literature on the subject of general principles of designing machines for pattern recognition. The paper reviews five U.S. and two Soviet references. It is concluded that a satisfactory pattern recognition machine must be able to simultaneously cover the entire field of vision; that it must be able to distinguish not only lines but also degrees of brightness and colors; that it should be able to recognize independently of size, orientation, and location of the object in the field of vision; that the number of channels transmitting information must decrease as the distance from the retina increases. There are 3 figures; and 7 references, 2 Soviet, 2 U.K., 3 U.S. The U.K. and U.S.

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On the Principles of Designing a Machine
for Pattern Recognition

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references are: W. K. Taylor, Pattern Recognition by Means of Automatic Analogue Apparatus, PIEEE, Vol 106, p B, Nr 26 (March 1959); R. L. Grimsdale, F. H. Sumner, C. I. Tunis, T. Kilburn, A System for the Automatic Recognition of Patterns, PIEEE, Vol 106, p B, Nr 26 (March 1959); N. Wiener, Cybernetics, John Wiley, New York; I. T. Culbertson, A Mechanism for Optic Nerve Conduction and Form Perception, Bulletin of Mathematical Biophysics, Vol 10, Nr 1, 2 (1948); A. Rappoport, Application of Information Networks to a Theory of Vision, Bulletin of Mathematical Biophysics, Vol 19 (1955).

SUBMITTED: October 23, 1959

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85480

9.3275

S/108/60/015/011/002/012
B019/B063

AUTHOR: Fayn, V. S., Member of the Society

TITLE: Spectrum of a Pulse Sequence With Time Modulation

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 11, pp. 23-25

TEXT: The author intended to obtain simple formulas for the calculation of the amplitudes of the spectroscopic components of a modulated pulse sequence, which are also sufficiently accurate for technical purposes. Such formulas had already been derived for those cases in which the ratio of the pulse-sequence frequency to the modulation frequency is either rational or irrational. Particularly simple results are obtained if the ratio between the two frequencies can be expressed by an integer. In order to make T/T_1 an integer, where T_1 and T are the pulse-sequence frequency and the modulation frequency, respectively, it is necessary, for instance, to change T_1 by ΔT_n . Then, $m(T_1 \pm \Delta T_n)/T = 1$ holds. In practice, $T/T_1 = 5 - 10$ and ΔT_n is therefore between 0.1 and 0.05. Under these

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Spectrum of a Pulse Sequence With
Time Modulation

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conditions, the author derives relation (7) for the complex amplitudes of the i -th spectroscopic component of a sequence of square pulses:

$$\vec{A}_{\Sigma p} = \frac{2E}{1\pi} \sum_{n=-\infty}^{\infty} \left\{ \frac{1}{n} \sin \frac{n\Omega T}{2} I_{n-p}(n\Omega \Delta T_1) \sqrt{\left\{ \sum_{k=1}^m \cos(nk\Omega T_1) \right\}^2 + \left\{ \sum_{k=1}^m \sin(nk\Omega T_1) \right\}^2} \right. \\ \left. \times \exp \left[i \left\{ \frac{\pi}{2} (ln-pl+1) - \frac{n\Omega T}{2} + \arctg \frac{\sum_{k=1}^m \sin(nk\Omega T_1)}{\sum_{k=1}^m \cos(nk\Omega T_1)} \right\} \right] \right\}$$

Finally, an example is calculated. There are 1 figure and 2 Soviet references.

SUBMITTED: January 5, 1959 (initially), June 26, 1959 (after revision)

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16,4100

25758
S/024/61/000/001/012/014
E031/E113

AUTHOR: Fayn, V.S. (Moscow)

TITLE: On the contraction of the expressions for the absolute descriptions of representations

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1961, No.1, pp.171-179

TEXT: In discussing the absolute description of a representation we shall be concerned with some form of expression for the line forming its continuous contour. The basic methods of approximating the representation of a function are: interpolation, quadratic approximation and uniform approximation. The last method is not practical for the present problem because of difficulties in its use. In the case of quadratic approximation truncated Fourier series are helpful in dealing with periodic functions. The method of interpolation is the simplest for constructing polynomial approximations. In order to apply these methods to the solution of the problem it is necessary to determine under what conditions the solution will be acceptable. This question can be answered on the basis of Lebesgue's theorem.

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On the contraction of the expressions.. E031/E113

In discussing the problem we may restrict ourselves to periodic functions since in the majority of cases the contour is closed. Before deciding which of the two methods to use a further question must be resolved. This is whether the truncated Fourier series is a better uniform approximation than a trigonometric interpolation polynomial if they are both of the n 'th order. By an application of Kotel'nikov's theorem the two expressions are shown to coincide. Hence the only criterion of choice between the two methods is practical simplicity, and interpolation wins on this count. To construct the representation it is necessary to calculate the quantities $n_c = \omega S / 2\pi$, where ω is the highest frequency in the spectrum and S is the period of the function. This calculation is based on the relation between the rate of convergence of the Fourier series for the given function and the occurrence in the function or its derivatives of discontinuities of the first order given by one of Jackson's theorems. An analogue method of using the expression derived for n_c to calculate these quantities is described. The problem of errors in the representation of a function through neglecting part of the spectrum is considered in an appendix. There are 9 Soviet references.

SUBMITTED: July 1, 1960 Card 2/2

28585

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E140/E435

6.9200

AUTHOR: Fayn, V.S.

TITLE: The recognition of space objects

SOURCE: Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii. Problemy peredachi informatsii, no.10, 1961, 49-56

TEXT: This paper was presented on the Vsesoyuznyy simpozium po uznayushchim i chitayushchim mashinam (All-Union Symposium on Recognizing and Reading Machines) held on June 14, 1960.

The process of recognizing a space object can be considered to consist of comparing a description of the object with a standard stored description. The description of a space object must be the description of its surface. The "most natural" method of obtaining this description is to divide the entire surface of the object into a large but finite number of arbitrarily small segments and to investigate the geometrical properties of each of the segments. For small enough segments, the number of distinct geometrical forms necessary for a good approximation is reduced. Such a procedure guarantees finiteness of the eventual
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The recognition of space objects

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description and therefore the possibility of processing it in a digital computer. Such descriptions must be based on the two-dimensional projections of the object to be recognized, due to the geometrical properties of the optical detection equipment. Considering a central projection, it is found that the descriptive parameters fall into two classes, those which preserve geometrical similarity (translation, magnification) and those which alter the geometrical form of the projection (rotation of the object). Since, in the general case, the number of possible projections of an object is infinite, this introduces essential difficulties into the process. The author proposes a solution "in principle" based on the use of a discrete plane retina. By "projection" we understand the curve tracing the perimeter of the actual projection. Considering the set of all continuous and closed curves whose lengths are included in defined limits as a space M , the curves constituting projections of a given object X_k will form a subspace M_k ; the subspaces of different objects will be different (although possibly intersecting, as the projection of the end face of a circular cylinder and the projection of a sphere). Further an operator F is defined in the Card 2/4 ✓

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The recognition of space objects

space M such that geometrically similar curves will be assigned identical numbers f , while those of different geometrical forms will obtain different numbers. It should be noted that this is made possible in principle by the hypothesis of the discrete retina. The author then proposes the scanning of the subspace M_k by a programme of incremental rotations of the object to be recognized such that all three mutually perpendicular axes of rotation are passed through in discrete increments, each possible combination of angles being obtained once and only once. The structure of the operator F is then examined. It consists of several stages, the first of which is to obtain a description of one single given projection dependent only on its geometrical form, based on the differential-geometrical properties of curves, and the expression of this in numerical form. Then, for uniqueness, an operation for establishing a common starting point for each description, which is obviously cyclical over the perimeter, is established. Then a machine for recognizing space objects will consist of the scanner and operator F , a memory and a comparator. The author proposes a parallel and sequential structure, in which the retina is divided into a large number of elementary regions, on each of which

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The recognition of space objects

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operations are performed in parallel, simultaneously, while the results of the operations at this level are processed in parallel at a second level, etc. This structure apparently concerns the operator F. No discussion is given on the operations to be performed on the set of elementary descriptions obtained over the entire scanning process. There are 8 Soviet references.

X

Card 4/4

21805

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B116/B212

9.7150 (also 1034)

AUTHOR: Fayn, V. S. (Moscow)

TITLE: Automation of the input of various data types into a computer

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 4, 1961, 536-538

TEXT: The present paper deals with the automatic transformation of diagrams, oscillograms, and similar representations of functions into a numerical (tabular) form. Here, the possibility is assured to use the data obtained directly in digital computers for solving the following problems: To find interpolation polynomials; to integrate and differentiate numerically; to solve a number of differential equations etc. A diagram or oscillogram may be continuous or discrete. A table, however, is always discrete. This makes it possible to employ a network to "view" the picture. This network is built in form of matrices which consists of single photo-sensitive components (receptors). For functions represented in rectangular Cartesian coordinates it is very convenient to use a rectangular matrix. The distance between the centers of two neighboring receptors of a row (or a column) serve for the unit of length and the standard for resolution of such a matrix.

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Automation of ...

The intervals between neighboring quantities in a table consist only of a whole number of units of length, where the smallest interval of length is equal to one unit of length. Since the functions $f(x, y) = 0$ can be ambiguous with respect to x for the general case, it will be useful to read the points not on the x -axis but on the curve itself. The table which is obtained by reading the diagram for this case corresponds to $x_1 = f_1(s_1)$, $y_1 = f_2(s_1)$, i.e., the curve is recorded in form of pairs of natural equations. The transforming device has to be able to find if the two respective activated receptors correspond to two neighboring readings s_i and s_{i+1} on the curve. The smallest reading interval is taken to be $s_{i+1} - s_i$. But the following details are also valid for larger intervals, if they have been selected according to certain rules and if the curves will satisfy the Dini conditions. The problem is solved with number chains. The method consists in: All possible number pairs of neighboring network receptors are stored in the storage of the device. Two receptors are considered neighboring if their centers can be connected by a straight line which passes through the areas covered only by these two receptors. The signals coming from the

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Automation of ...

network contain the information about the number of activated receptors and they are compared with the number pairs of neighboring receptors which have been stored in the storage. For further evaluation only those pairs are allowed to pass whose both numbers correspond to activated receptors in the respective picture. These pairs are called activated pairs. The number chain is setup as follows: e.g., the left number of an arbitrary activated pair is taken and a corresponding pair is found among the other activated pairs, that has also this number. The other number of pair found is written to the left of the initial pair. Now, the right number of the initial pair is taken and the same process is repeated. The second number of the found pair is written to the right of the initial pair. The same process is done for the left and right outer number of the chain obtained (consisting of four numbers). An interruption of this process may have the following two causes: 1) There are no activated pairs left (it corresponds to a curve without discontinuities); 2) there are no pairs with outer chain numbers among the remaining activated pairs; here, the counter of the chains will register the end of a chain and any remaining pair is now taken to build up the next number chain. If the curve will have a point of intersection, the receptor number corresponding to that point will be found in more than two

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activated pairs. Each number of the chain will contain the coordinates x_1 and y_1 of the corresponding i -th receptor in a coded form. The recording of each chain is the desired tabulated function. The diagram which is shown in the Fig. is used to demonstrate the above principle for four receptors. The activation of a receptor corresponds to the positive potential at its output (Fig. a). Fig. b shows a curve where the positive signal will appear at the output 3, 4; i.e., the pair 3, 4 is activated and will be stored. All other processes which have been mentioned may be realized with conventional computer components. The storage diagram (part of it is shown in Fig. a) may be separated into single sections that operate matching sections of the network. There are 1 figure and 5 Soviet-bloc references.

SUBMITTED: November 29, 1960

Card 4/5

FAYN, V.S. (Moskva)

Problem concerning the recognition of images in complex representations. Izv.AN SSSR.Otd.tekh.nauk.Energ.i avtom. no.2:162-163 Mr-
Ap '62. (MIRA 15:4)
(Perceptrons) (Electronic calculating machines)

FAYN, V. S.

Dissertation defended at the institute of Automation and Telemechanics (1962)
for the academic degree of Candidate of Technical Sciences:

"Methods of Automatic Identification of Objects from Their Projections
into Complex Images."

Vestnik Akad Nauk, No. 4, 1963, pp. 119-145

L 25092-65 EWT(d)/TDB(jj)/T/EED-2/ENP(1) Pj-4/Pq-4/Pg-4/Ph-4/Pk-4/Pl-4 IJP(c)
BB/GG

ACCESSION NR: AT4049773

S/2945/64/000/016/0048/0056

AUTHOR: Kukinov, A.M.; Fayn, V.S.

TITLE: Modeling of a pattern recognition method using an electronic computer

SOURCE: AN SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, no. 16, 1964. Teoriya peredachi informatsii (Theory of information transmission), 48-56

TOPIC TAGS: electronic digital computer, pattern recognition, character recognition

ABSTRACT: The paper describes an experimental verification of the method of pattern recognition developed earlier by the author (Izvestiya Akad. Nauk SSSR, Otdel Tekhnich. Nauk, Energetika i avtomatika, No. 2, 1962). For modeling the method, the "Strela" electronic digital computer of the Vy*chislitel'nyy tsentr AN SSSR (Computer center of the Academy of sciences SSSR) was used. One thousand projections, collected at random from photographs, were sampled. On the basis of this sampling, all the stages of the recognition process were modeled. The method of calculating the standard deviation of the significant features is described as well as the algorithms used for modeling the recognition process. A comparison of the experimental results obtained

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with the results calculated by theoretical formulas has shown that the latter differ by a factor not exceeding 1.5 and this is considered to be a good agreement for the problem examined. The paper concludes that the described method of modeling the Fayn technique of pattern recognition using a computer has furnished an experimental verification of the validity of the principle of pattern recognition employed in Fayn's method. Orig. art. has: 3 figures, 2 tables, and 24 formulas.

ASSOCIATION: none

SUBMITTED: 20Dec62

ENCL: 00

SUB CODE: DP

NO REF SOV: 001

OTHER: 000

Card 2/2

fact . . .

"Utilization of the orderliness of texts for extending the capabilities of
reading machines. Probl. pered. inform. 1 no.1:72-79 '65. (MIRA 18:7)

L 9728-66	ENT(d)/ENP(1)	IJP(c)	BB/G3
ACC NR: AP5028628		SOURCE CODE: UR/0030/65/000/010/0127/0129	
AUTHOR: <u>Payn, V. S.</u> (Candidate of technical sciences)			
ORG: none			
TITLE: <u>First all-union symposium on automatic pattern recognition</u>			
SOURCE: AN SSSR. Vestnik, no. 10, 1965, 127-129			
TOPIC TAGS: data processing conference, <u>pattern recognition</u> , automaton, character reading equipment, learning mechanism, reading machine			
ABSTRACT: The First All-Union Symposium on Automatic Pattern Recognition, organized by the Scientific Council on the Overall Problem of Cybernetics of the Academy of Sciences USSR, was held in Moscow from 16 to 18 June 1965. Over sixty papers were presented on the following topics: 1) General problems in pattern recognition; 2) learning automata; 3) recognition of visual and aural patterns, and 4) reading automata.			
The papers on the first topic were primarily concerned with determining possible general and at the same time readily realizable learning algorithms. (G. T. Trubovich, V. A. Yakubovich and co-workers). Several papers dealt with asymptotic evaluation of possibilities for learning algorithms			
Card 1/3			

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L 9728-66

ACC NR: AP5028628

(V. N. ⁴⁴Vanik, and A. Ya. ⁴⁴Chervonenkis) and with establishing the relation between the deterministic and statistical aspects of learning algorithms (V. A. ⁴⁴Kovalevskiy, V. I. ⁴⁴Loginov, Ya. I. ⁴⁴Khurgin, and others). 28

The papers on the second topic dealt on the whole with the study of practically important learning algorithms for pattern recognition problems (A. A. ⁴⁴Natan, O. I. ⁴⁴Trakhtman, A. G. ⁴⁴Frantsuz, and others). The pattern recognition problem in the presence of disturbances was analyzed in several papers (V. L. ⁴⁴Levshina, A. V. ⁴⁴Seredinskiy, and T. M. ⁴⁴Tsykunova). It is worthwhile to note that the papers which were presented indicated certain modifications of views concerning perceptrons and their possibilities. Although many papers presented at the symposium included algorithms of the perceptron type, significant progress was made both in the critical evaluation of the omnipotence of perceptrons as well as in the exact determination of boundaries within which rational application of perceptrons is possible.

The papers concerning the third topic dealt mostly with developing the general theory of recognition of visual and aural patterns on the basis of data obtained from the construction of heuristic recognition algorithms for particular patterns (M. M. ⁴⁴Bongard, V. S. ⁴⁴Fayn, I. I. ⁴⁴Tsukkerman and co-workers, et al). Psychophysiological aspects of human visual pattern recognition have been analyzed (V. D. ⁴⁴Glaser). The progress made in

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L 9728-66

ACC NR: AP5028628

solving practical pattern recognition problems was demonstrated in a series of papers (A. V. Knipper and O. A. Petrov; Ye. M. Myasnikova and co-workers; and G. I. Tsemel').

22

Several papers were presented on reading automata (automata recognizing the symbols of printed or written texts) which are already in operation (M. L. Ayrakh and co-workers; A. S. Barashko and co-workers; S. K. Vosil'yus, P. U. Yasin'yevichus, and others) and also on improving methods for selecting the attributes and engineering devices for reading automata (N. Ya. Birman, K. Vrana (Czechoslovakia), V. G. Komandrovskiy, and others).

The symposium revealed the most interesting and promising trends in the field of pattern recognition and established the direction for further studies. [ATD Press: 4145]

SUB CODE: 09 / SUBM DATE: none

Card

3/3

L 04269-67

ACC NR: AP6013307

SOURCE CODE: UR/0413/66/000/008/0099/0099

AUTHOR: Fayn, V. S.

ORG: none

TITLE: A method for separating the representations of individual objects from a complicated drawing including numerous lines. Class 42, No. 180859

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 8, 1966, 99

TOPIC TAGS: graphic technique, image projection, optic image, electronic image

ABSTRACT: This Author Certificate presents a method for separating the representations of individual objects from a complex representation involving numerous lines. To recognize the representations of objects drawn on the background of other representations, a complex drawing is projected upon a resistive light-sensitive layer spread on a transparent nonconducting base. Through the leads in contact with this layer, the "search" voltages are then fed in sequence so as to excite the luminophors spread over the light-sensitive layer and over the leads at the location of the increased conductivity limited by the projection of the nearest closed contour. Next, the zone exposed on the electroluminophor is projected onto a receiving field of the recognizing automatic device, with the voltage fed only once to each zone.

SUB CODE: 20/ SUBM DATE: 28Oct61

Card 1/1 fv

UDC: 681.142.-523.8

PLAKIDIN, Val.L; FAYN, V. Ya.

Bromination of 1,4-dihydroxy-5,8-dihydronaphthalene. Ukr. khim.
zhur. 27 no.2:244-246 '61. (MIRA 14:3)

1. Nauchno-issledovatel'skiy institut organicheskikh poluprodukтов
i krasiteley im. K. Ya. Veroshilova, filial, g. Rubeshnoye.
(Naphthalene) (Bromination)

FAYN, V.Ya.; PLAKIDIN, Val.L.

Nitration of 1-methylantraquinone. Zhur.ob.khim. 31 no.5:1588-
1589 My '61. (MIRA 14:5)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley, filial v.g. Rubeshnoye.
(Anthraquinone) (Nitration)

FAYN, V.Ya.; GOLOMB, L.M.; PLAKIDIN, Val.L.

Study of vat sols dyeing red. Zhur.prikl.khim. 34 no.7:1640-1642 J1
'61. (MIRA 14:7)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i
krasiteley imeni K.Ye.Voroshilova, filial v g. Rubezhnoye.
(Dyes and dyeing)

PLAKIDIN, Val.L.; FAYN, V.Ya.; TRUNOV-KRASOVSKIY, V.I.

Preparation of 1-methylantraquinone by diene synthesis. Zhur.
prikl.khim. 34 no.7:1643-1645 J1 '61. (MIRA 14:7)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley imeni K.Ye.Voroshilova, filial v g. Rubezhnoye.
(Anthraquinone) (Olefins)

DOKUNIKHIN, N.S.; FAYN, V.Ya.

[Anthraquinonyl- 1-carbonyl]-aminoanthraquinones. Zhur. prikl.
khim. 36 no.12:2768-2771 D'63. (MIRA 17:2)

1. Nauchno-issledovatel'skiy institut organicheskikh polupro-
duktov i krasiteley i filial Nauchno-issledovatel'skogo
instituta organicheskikh poluproduktov i krasiteley, g.
Rubezhnoye.

DOKOVIKHIN, N.S.; FAYN, V. Ya.

~~Pyridone-anthracene and its derivatives. Part I. Syn. of.~~
khim. 34 no.7:2372-2374 J1 74 (MIR 17:8)

Some derivatives of anthracene-1-carboxylic and anthracene-1,4-carboxylic acids. Ibid.:2374-2378

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley i yego filial v g. Khabarovsk.

DOKUNIKHIN, N.S.; FAYN, V.Ya.

Pyridazonanthrone and its derivatives. Part 2: N-arylpyridazonanthrones. Zhur. ob. khim. 34 no.10:3354-3359 0 '64.

(MIRA 17:11)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley i filial Nauchno-issledovatel'skogo instituta organicheskikh poluproduktov i krasiteley v g. Rubezhnoye.

DOKUNIKHIN, N.S.; FAYN, V.Ya.

Pyridazoneanthrone and its derivatives. Part 3: Oxazoneanthrone
and its relation to pyridazoneanthrone. Zhur. ob. khim. 34
no.11:3769-3771 N '64 (MIRA 18:1)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov
i krasiteley i yego filial v g. Rubezhnoye.

DOKUMENI, N.S.; FAYN, V.Ya.; PACHEVA, N.A.

4-Methyl-1-(alkyl, aryl)-aminoanthraquinones. Zhur.prikl.khim.
38 no.11:2619-2621 N '65.

(MIRA 18:12)

1. Submitted November 13, 1963.

1. FAYN, Ya.
2. USSR (600)
4. Sewer Pipe
7. S. G. Pirogov's cart for transporting large diameter pipes. Stek. 1 ker.
10 No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, May 1953, Unclassified.

FAIR Y.M.

NATKOVICH, S.I.; RAYN, Ya.M.

Improving the organisation and establishment of work norms in
factories of leather accessories. Leg.prom. 16 no.10:17-18 0 '56.
(MIRA 10:12)

(Leather industry)

KATKOVICH, S.I.; FAYN, Ya.M.

Cutting out simultaneously many layers of artificial leather on
KPE presses. Leg.prom.16 no.12:45-47 D '56. (MLRA 10:2)
(Leather, Artificial) (Shoe industry)

NATKOVICH, S.I., glavnyy inzh.; FAYN, Ya.M.

Leather substitutes used in the leather-haberdashery industry.
Leg.prom. 18 no.11:43-45 N '58. (MIRA 11:12)
(Leather substitutes)

PAYN, Ya.S.; GERTSOV, A.A., redaktor; GALAKTIONOVA, Ye.N., tekhnicheskii
redaktor

[Examples of calculating stone and concrete bridges] Primery rascheta
kamennykh i betonnykh mostov. Moskva, Izd-vo dorozhno-tekhn. lit-ry,
1951. 190 p. (MIRA 9:1)
(Bridges, Concrete) (Bridges, Stone)

FAYN, YA S.

Primery rascheta kamennykh i betonnykh mostov. Wu-kung Kung-Ch'iao Shechi (Plans for stone (arched) bridges, tr. by) Yu T'iao-Mei Ch'ien Chung-i. Shanghai, Shanghai Hsin-Ya, 1953.
182 p. illus., diags., tables. Chinese translation from the original Russian.

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754.8
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[illegible]

"Map showing the Sources in England of Contraband Goods from the United States." *United States Customs Service*, 1904.

Surv. of Scientific and Technical Dissertations Accepted in 1958
Higher Educational Institutions(10)

30: Ser. No. 481, 5 May 55

SOV/124-57-4-4916

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 4, p 141 (USSR)

AUTHOR: Fayn, Ya.S.

TITLE: Self-stressed Arches (Samonapryagayemyye svody)

PERIODICAL: Sb. nauch. soobshch. Saratovsk. avtomob.-dor. in-t, 1956, Nr 3,
pp 21-25

ABSTRACT: Bibliographic entry

Card 1/1

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 4, p 142 (USSR) SOV/124-57-4-4926

AUTHOR: Fayn, Ya. S.

TITLE: Stress Control in Hingeless Concrete Arches With the Help of Uneven Shrinkage Contractions (Self-stressed Concrete Arches) [Regulirovaniye napryazheniy v bessharnirnykh betonnykh svodakh s pomoshch'yu neravnomernykh usadochnykh ukorocheniy (Samonapryagayemyye betonnyye svody)]

PERIODICAL: Tr. Saratovsk. avtomob.-dor. in-ta, 1956, Nr 14, pp 115-139

ABSTRACT: Bibliographic entry

Card 1/1

FAYN, Yakov Solomonovich, kandidat tekhnicheskikh nauk, dotsent; ~~DMITRIYEV,~~
~~Aleksey Dmitriyevich,~~ kandidat tekhnicheskikh nauk, dotsent;
SMIRNOYEV, A.F., redaktor; GALAKTIONOVA, Ye.N., tekhnicheskiiy redaktor

[Examples of planning of tunnels for automobile roads] Primery
proektirovaniia avtodorozhnykh tonnelei. Moskva, Nauchno-tekhn.
izd-vo avtotransp.lit-ry, 1957. 186 p. (MLRA 10:9)
(Tunnels)

124-58-9-10514

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 155 (USSR)

AUTHOR: Fayn, Ya. S.

TITLE: On the Calculation of Tunnel Linings as Freely Deformed Rings
(K raschetu tunnel'noy obdelki kak svobodno deformiruyemogo kol'tsa)

PERIODICAL: Tr. Saratovsk. avtomob. -dor. in-ta, 1957, Vol 15, Nr 1,
pp 71-80

ABSTRACT: Bibliographic entry

1. Underground structures--Mathematical analysis

Card 1/1

FAYN, Ya.S.; SAPEZHKO, Yu.P.

Designing precast girder highway bridges for constant load.
Avt.dor. 22 no.11:31 N '59. (MIRA 13:2)
(Bridges--Design)

FAYN, Ya.S., kand.tekhn.nauk

Useful book ("Design of tunnel linings" by M.A.Arkhangeli'skii, D.I.
Dzhincharadze, A.S.Kuris'ko). Reviewed by IA. S.Fain. Transp.stroi.
11 no.4:58 Ap '61. (MIRA 14:5)
(Tunnels) (Reinforced concrete construction)
(Arkhangeli'skii, M.A.) (Dzhincharadze, D.I.) (Kuris'ko, A.S)

FAYN, Ya.S., kand.tekhn.nauk

Single-piece tunnel sections of prestressed concrete.

Transp. stroi. ll no.7:54-55 Jl '61.

(MIRA 14:7)

(Hamburg--Tunnel lining) (Prestressed concrete construction)

FAYN, Ya.S., kand.tekhn.nauk

Rubber and steel bearings for great pressures. Avt.dor. 24 no.6:
29 Je '61. (MIRA 14:7)
(Germany, West—Bridges—Bearings)

FAYN, Ia.S., dotsent; GOKHMAN, V.A.

Surveying and designing highways in mountain regions. Avt.dor.
25 no.7:30-31 JI '62. (MIRA 15:8)
(Mountain roads)

FAYN, Ya.S., kand. tekhn. nauk

Designing bridges considering the torsion of main beams. Avt. dor.
25 no.12:23 D '62. (MIRA 16:2)

(Bridges, Iron and steel—Design)

FAYN, Ya.S., kand. tekhn. nauk

Designing nonreinforced road slabs. Avt. dor. 26 no.5:20 My '63.
(MIRA 16:7)

(Pavements, Concrete)

AID P - 3776

Subject : USSR/Electricity

Card 1/1 Pub. 26 - 18/29

Authors : Kochneva, Ye. G., Eng., A. P. Mamet, Doc. Tech. Sci.,
and Ye. I. Fayn, Eng.

Title : Testing of a salt concentrator

Periodical : Elek. sta., 10, 51-53, 0 1955

Abstract : The authors describe the testing of a salt concentrator
of the BPK type for testing the salt contents of high
pressure saturated steam, They present results in
three tables. Two drawings, 1 diagram.

Institution : None

Submitted : No date

FAYN, Ye.L., FINKEL', I.I.

Nonparasitic liver cysts. Sov.med. 22 no.7:118-123 J1958 (MIRA 11:10)

1. Iz terapevticheskogo otdeleniya (nauchnyy rukovoditel' - prof. A.M. Danir) i patologoanatomicheskogo otdeleniya (prorektor - prof. Ya.L. Rapport) 4-y gorodskoy klinicheskoy bol'nitsy Moskvy (glavnyy vrach - saslyzhennyy vrach RSFSR M.V. Ivanyukov).
(LIVER, cysts
nonparasitic (Rus))

KIRZHNITS, D.A.; FAYNBER, V.Ya.; FRADKIN, Ye.S.

Structure of Green's function of a photon. Zhur. eksp. i teor.
fiz. 38 no. 1:239-242 Jan '60. (MIRA 14:9)

Phys. C
1. Institut im P.N. Lebedeva AN SSSR.
// (Potential, Theory of) (Photons)

FAYNBERG, A.

Infrared heaters in open parking areas. Avt. transp. 41 no.5:51
My '63. (MIRA 16:10)

(Motor vehicles—Cold weather operation)
(Infrared rays—Industrial applications)

FAYNBERG, A.

UDU-S level indicator. Neftianik 7 no.5:28 My '62.

(MIRA 15:12)

(Liquid level indicators)
(Moscow—Exhibitions)

FAYNBERG, A-D

Charge Distributor for Washington
P. O. Box 1000
Knoxville, TN 37901-1000

FAYNBERG, A.D.; STEBLIN, A.M.

The charging unit in capacity blast furnaces, Stal' 24 no.12;
1077-1078 D '64. (MIRA 18:2)

1. Zhdanovskiy filial Ukgipromeza.

FAYNBERG, A.D.

Existence of blast furnace charging equipment. Steel
15.12.1980 0 '65. (MIRA 18:12)

1. Shtanovskiy filial "Korgipromaz".

SAVENEVO, A. I., 1921.

1. Kibor. Klenare. Tsvet. i sel'khoz. n. 1967-25 1. 16.
(MIRA 16x2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sel'sko-
khozyaystvennogo mashinostroyeniya.

Y. I. I.

Instructions and forms for planning the financing of industry of public works 2. perer.
izd. Moskva, Gormashukhe', 1968. 144 p. (53-35303)

HDH67h.A5 1968

FAYNBERG, A. I.

N/5
108.3
.F2

Analiz khozyaystvennoy deyatel'nosti kommunal'nykh predpriyatiy (Analysis of economic activity of municipal enterprises) Moskva, Izd-vo. Ministerstva Kommunal'nogo Khozyaystva RSFSR, 1953.

230 p. tables.

FAYNBERG, A.I.; REZNIK, A.I.; SOLOMIN, V.V.; LIBERMAN, Ya.A.; ALEKSEYEV, S.A.;
VASSERMAN, S.Z.; BORISOVSKIY, S.P., red.; ALTUF'YEVA, A.M., red.
izd-va; KONYASHINA, A.D., tekhn.red.

[Drawing up plans for housing and municipal services] Metodika
sostavleniya plana zhilishchno-kommunal'nogo khoziaistva. Pod
red. S.P.Borisovskogo. Moskva, Izd-vo M-va kommun. khoz. RSFSR,
1957. 408 p. (MIRA 11:3)
(Housing) (Municipal services)

CHESTNIY, Mikhail Grigor'yevich; FAYNBERG, A.I., red.; YAROSHEVSKIY, V.M.,
red.isd-va; RAKITIN, I.T., tekhn.red.

[Calculation of the capacity of water-supply lines] Uchet vedy
na vedoprovedakh. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1958.
42 p. (MIRA 13:6)
(Water-supply engineering--Tables, calculations, etc.)

FAYNBERG, A.I.; BORISOVSKIY, S.P., red.

[Drafting a plan for housing and municipal services] Metodika so-
stavleniia plana zhilishchno-kommunal'nogo khoziaistva. Iss.2., perer.
i dop. Moskva, Izd-vo M-va kommun. khoz. RSFSR, 1959. 449 p.
(Housing) (Municipal services) (MBA 14:8)

FAYNBERG, A.I., kand.ekon.nauk; DOMBROVSKIY, A.A., kand.ekon.nauk;
POPOV, N.S., kand.ekon.nauk; SKVORTSOVA, N.T., kand.ekon.nauk;
STROGANOVA, T.A., kand.ekon.nauk. Prinieli uchastiye: BOLOFINA,
O.A., kand.ekon.nauk; GUL'BINOVICH, M.I., PROTSENKO, D.I., red.;
SALAZKOV, N.P., tekhn.red.

[Economics, organization, and planning of municipal services]
Ekonomika, organizatsiya i planirovaniye gorodskogo khoziaistva.
Pod obshchey red. A.I.Fainberga. Moskva, Izd-vo M-vo kommun.
khoz.RSPSR, 1959. 451 p. (MIRA 13:2)
(Municipal services)

FAYNBERG, A.I.; REZNIK, A.I.; GVOZDEV, A.M.; FILATOV, N.L.;
USHENKO, V.S., red.; SALAZKOV, N.P., tekhn. red.

[Problems on the methodology for planned calculations and
analysis of administrative operations in communal housing and
services] Sbornik zadach po metodike planovykh raschetov i ana-
lizu khoziaistvennoi deiatel'nosti v kommunal'nom khoziaistve.
[By] A.I. Fainberg i dr. Moskva, Izd-vo M-va kommun. khoz.
RSFSR, 1962. 233 p. (MIRA 15:12)

(Housing management--Accounting)

(Municipal services--Accounting)

20

FAYNBERG, A.M.
CA

Carbonization of products made of cement and the like, with a calcareous binding material. A. M. Faynberg and G. L. Tiberis. U.S.S.R. 69,190, Nov. 30, 1947. To increase the work. strength of structural objects made with calcareous cements or mixes, they are preliminarily dried and then calc. with CO_2 until they attain a porosity of 10%. For this process waste gases from lime kilns can be used. M. Hirsch

FAYNBERG, A.S.

New exhibits. Neftianik 6 no.8:23 Ag '61.

(MIRA 14:10)

1. Starshiy ekskursvod pavil'ona "Neft' i gaz" na Vystavke
dostizheniy narodnogo khozyaystva.
(Tanks) (Viscosity)

L 31573-66 EWT(d)/EWP(1) IJP(c) BB/GG/GD
ACC NR: AT6006273 SOURCE CODE: UR/0000/64/000/000/0143/0147

81
79
8+1

AUTHOR: Faynberg, A. S.

ORG: none

TITLE: The "LEIS-UM" ¹⁰teaching electronic digital computer ^{16C}

SOURCE: Leningrad. Elektrotekhnicheskii institut svyazi. Nauchno-tekhnicheskaya konferentsiya. Trudy, no. 1, 1964, 143-147

TOPIC TAGS: semiconductor diode, transistor, electric relay, teaching machine, electronic computer, digital computer, computer design/
P-14 transistor, P-601 transistor, P-201 transistor, PKN electric relay

ABSTRACT: The author presents a brief description of the "LEIS-UM" teaching electronic computer, developed at the Department of Theoretical Radio Engineering, Leningrad Electrotechnical Institute im. Prof. M. A. Bonch-Bruyevich (kafedra teoreticheskoy radiotekhniki Leningradskiy elektrotekhnicheskii institut). The aim was to create a simple and inexpensive computer which reflects the logic of the operation of the fundamental functioning units of all-purpose computers and, at the same time, makes it possible to solve uncomplicated problems similar to those solved in series-produced digital computers. The following basic operations are employed in the computer: addition, subtraction, and multiplication, as well as conditional transfer. Division may be programmed by means

Card 1/2

L 31573-66
ACC NR: AT6006273

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of the four basic operations. The computer is intended for teaching students the course "Fundamentals of computer technology." It operates on a program recorded on a motion picture tape, and may also be coded manually. The computer is small enough (1100 x 1000 x 600 mm) to be placed on a medium-size laboratory stand. It consists of about 200 P-14 transistors, including 8 P-601 and 9 P-201 transistors, 20 PKN relays, and semiconductor diodes. It weighs 100 kg. It is powered by a city a-c network (127/220 v). In conclusion, the author considers it his duty to thank Docent L. M. Gol'denberg for attention to this work, and G. Ya. Khodorov for participating in the development of the input setup. Orig. art. has: 4 figures.

SUB CODE: 09 / SUBM DATE: 06Dec64 /

Card 2/2 *X*

FAYNBERG, A.S., starshiy skakursovod

Flameless burners. Neftianik 6 no.11:23 N '61. (MIRA 14:12)

1. Pavil'on "Neft' i gaz" na Vystavke dostizheniy narodnogo
khozyaystva SSSR.
(Gas burners)

ATADZHANOV, R.: PAYNEBERG, B.

At the Institute of Economics of the Academy of Sciences of the
Turkmen S.S.R. Vop. ekon. no.4:157-158 Ap '59.

(MIRA 12:7)

(Turkmenistan--Economics--Study and teaching)

RAITBERG, E.

Growth of production. Most. prom. i khud. promys. 2 no.6:6-7
Je '61. (MIRA 14:7)

1. Nauchel'nik otbela Glavnostprava pri Soveto Ministrov
Technol'nyy SSB, G. Ashkhabad.
(Turkmenistan Industries)

ZHDANOVSKIY, N.S., doktor tekhn. nauk, prof.; FAYNLLYB, B.N., kanda. dokim. nauk;
ZUBRITSKIY, B.N., inzh.

Effect of the intensity of the process of combustion on the wearing
rate of piston rings. Trakt. i sel'khoz mash. no.9:3-5 S '64.
(MIRA 17:11)

1. TSentral'nyy nauchno-issledovatel'skiy i konstruktorskiy institut
toplivnoy apparatury avtotraktornykh i statsionarnykh dvigateley i
Leningradskiy sel'skokhozyaystvennyy institut.

FAYNBERG, L.S.

BAGDASAROV, S.M., inzh.; FAYNBERG, L.S., inzh.; FALYEV, V.G., inzh.

Industrial methods for producing surface mixes for outdoor sport
facilities. Gor. khoz. Mosk. 32 no.3:27-30 Mr '58. (MIRA 11:3)
(Athletic fields)

GORELYSHEV, N. V.; BAGDASAROV, S. M.; LOBZOVA, K. Ya.; LYUBAVTSEVA,
T. N.; AVLASOVA, N. M.; FAYNBERG, E. S.

Laying rough-surfaced asphalt-concrete pavements. Avt. dor. 25
no.10:4-6 0 '62. (MIRA 15:10)

(Pavements) (Asphalt concrete)

BOGDASAROV, S.M.; PLOTNIKOVA, I.A.; FAYNBERG, E.S.; FOMIN, A.I.

Acoustic method for preparing emulsions. Avt.dor. 25 no.11:12-
13 N '62. (MIRA 15:12)
(Road materials)

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Laying a rough coat over worn spots in concrete surfacing.
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BAGDASAROV, S.M.; FAYNBERG, E.S.; ZOLOTAREV, Yu.Ye.

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27 no.4:10-11 Ap '64. (MIRA 17:9)

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PAYMENT, . . .

USSR/Chemistry - Synthetic Fibers

Jul/Aug 53

"Investigation of the Structure of Polyamide Fibers.
I. Sorption of Water by Polycaprolactam Fibers,"
N. V. Mikhaylov, E. Z. Faynberg, S. M. Skuratov,
All-Union Sci-Res Inst of Syn Fibers

Koll Zhur, Vol 15, No 4, pp 271-276

Determined the effect of orientation (stretching) of
polycaprolactam fibers on the adsorption and de-
sorption of water. Showed that it is difficult to
desorb the last traces of water from non-oriented

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fibers. Assumes that impeded desorption is due to
the presence of certain types of hydrogen bonds, and
that the nature of these bonds changes with pressure.

270T13

FAYN
✓ The structure of polyamide fibers. I. Sorption of water
by Capron fibers. N. V. Mikhalov, E. Z. Feinberg, and
B. M. Skuratov. Colloid J. U.S.S.R. 15, 278-83 (1953)
(Engl. translation).—See C.A. 47, 11740a. H. L. H.

FAYNBERG, E. Z.

The structure of synthetic polyamide fibers. II. Integral heat of wetting of capton fibers with water. S. M. Skuratov, N. V. Mikhlinov, and E. Z. Faynberg. *Kolloid. Zhur.* 16, 59-61 (1954); cf. *C.A.* 47, 11740h. — The heat Q of wetting of dry, unoriented poly- ϵ -caprolactam (I) fibers increased with time from, e.g., 6.78 cal./g. 10 days to 5.8 cal./g. 4 months after manuf.; it remained const. thereafter. The Q of dry, oriented I varied from batch to batch but increased with time in one batch; e.g., it was 2.6 cal./g. 1 month and 6.2 cal./g. 7 months after manuf. Apparently, the structure of unoriented I becomes more regular in time, while in oriented I slow relaxation occurs. The microcalorimeter used is described. It was tested by detg. the Q of hydrocellulose (25.89 cal./g.). J. L. D.

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frared heat of wetting of Capron fibers with water. S. M.
Skuratsky, N. V. Mikhailov, and E. Z. Fainberg. *Colloid*
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